DOCUMENT RESUME

ED 275 336 IR 051 684

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TITLE the Integrated Bibliographic Information System: Resource Sharing Tailored for Local Needs.
INSTITUTION Defense Technical Information Center (DOD), Alexandria, VA.
SPONS AGENCY Department of Defense, Washington, D.C.
REPORT NO DTIC/TR-85/17
PUB DATE Nov 85
NOTE 10p.; For a study of design requirements for the system, see IR 051 683.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Access to Information; Bibliographic Utilities; *Government Libraries; Information Retrieval; *Library Automation; *Library Networks; *Machine Readable Cataloging; Online Catalogs; *Scientific and Technical Information; *Shared Library Resources; User Needs (Information)
IDENTIFIERS Defense Technical Information Center; Gateway Systems; *Integrated Bibliographic Information System (DoD)

ABSTRACT

The Defense Technical Information Center (DTIC), which is charged with providing information services to the scientific and technical community of the Department of Defense (DoD), actively seeks ways to promote resource sharing as a means for speeding access to information while reducing the costs of information processing throughout the defense technical library community. As part of this research, DTIC is sponsoring the development of the Integrated Bibliographic Information System (IBIS). The system prototype, which has been under development since April 1983, will be used to demonstrate and evaluate the advantages of combining an integrated library system with an intelligent gateway capable of simultaneously querying and updating heterogeneous bibliographic databases using a common command language. Users will be able to download and post-process data from external sources, thus allowing them to tailor search results to their patrons' needs economically and efficiently. Upon the successful conclusion of the demonstration project, DTIC plans to implement an operational version of the IBIS which will be the baseline component of a coordinated scientific and technical information (STI) network joining together the libraries and information centers of the DoD. Six references are listed. (KM)

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REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified/Unlimited	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) DTIC/TR-85/17	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION Defense Technical Information Center 6b. OFFICE SYMBOL (If applicable) DTIC	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) Cameron Station Alexandria, VA 22304-6145	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Defense Technical Information Center 8b. OFFICE SYMBOL (If applicable) DTIC	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code) Cameron Station Alexandria, VA 22304-6145	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. 658015 / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO. 05000056
11. TITLE (Include Security Classification) The Integrated Bibliographic Information System: Resource Sharing Tailored for Local Needs	
12. PERSONAL AUTHOR(S) Cotter, Gladys A.; Hartt, Richard W. (Logistics Management Institute)	
13a. TYPE OF REPORT Final 13b. TIME COVERED FROM _____ TO _____ 14. DATE OF REPORT (Year, Month, Day) 851100 15. PAGE COUNT 10	
16. SUPPLEMENTARY NOTATION Presented at the International Online Meeting, London, England	

17. COSATI CODES		
FIELD	GROUP	SUB-GROUP
5	2	
9	2	

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
Resource Sharing, Shared Cataloging, Integrated Library System, Gateway, Shared Bibliographic Input Network (SBIN), Local Automation Model (LAM)

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The Defense Technical Information Center (DTIC) is charged with providing information services to the scientific and technical community of the Department of Defense (DoD). These services range from collecting and disseminating bibliographic information to sponsoring and directing research into innovative information handling technologies. Through this research, DTIC actively seeks ways to promote resource sharing as a means for speeding access to information while reducing the costs of information processing throughout the Defense technical library community. As part of this research, DTIC is sponsoring the development of an Integrated Bibliographic Information System (IBIS). The prototype of this system has been under development since April 1983. It will be used to demonstrate and evaluate the advantages of combining an integrated library system with an intelligent gateway

(Continued on reverse)

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT ☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified/Unlimited
22a. NAME OF RESPONSIBLE INDIVIDUAL Gladys A. Cotter	22b. TELEPHONE (Include Area Code) (202) 274-7661 22c. OFFICE SYMBOL DTIC-EA

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted. All other editions are obsolete.

19. ABSTRACT (continued)

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DTIC plans to implement an operational version of the IBIS upon the successful conclusion of the demonstration project. This operational system will be the baseline component of a coordinated scientific and technical information (STI) network joining together the libraries and information centers of the DoD.

The Integrated Bibliographic Information System:

Resource Sharing Tailored for Local Needs

by

Gladys A. Cotter and Richard W. Hartt

Keywords: Resource Sharing, Shared Cataloging, Integrated Library System (ILS), Intelligent Gateway, Bibliographic Databases.
Abstract: The Defense Technical Information Center (DTIC) is charged with providing information services to the scientific and technical community of the Department of Defense (DoD). These services range from collecting and disseminating bibliographic information to sponsoring and directing research into innovative information handling technologies. Through this research, DTIC actively seeks ways to promote resource sharing as a means for speeding access to information while reducing the costs of information processing throughout the Defense technical library community. As part of this research, DTIC is sponsoring the development of an Integrated Bibliographic Information System (IBIS). The prototype of this system has been under development since April 1983. It will be used to demonstrate and evaluate the advantages of combining an integrated library system with an intelligent gateway capable of querying and updating -- simultaneously -- heterogeneous bibliographic databases. Queries and updates of databases will be performed using a common command language, relieving the system user of the need to master separate languages and procedures for each database accessed. Users will be able to download and post-process data from external sources. This capability will allow libraries to tailor search results -- derived from external sources and a local catalog -- to their patron's needs and deliver a single product in an economical and efficient manner.

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INTRODUCTION

The Defense Technical Information Center (DTIC) is the clearinghouse for scientific and technical information within the Department of Defense (DoD). In addition to operating an online catalog of technical report citations with over 1.5 million titles, the Center is charged with integrating DoD libraries and information centers through the development and implementation of a coordinated scientific and technical information (STI) network. The Center sponsors and conducts research and development in areas that have the potential for improving the flow of information to and within the DoD STI network. This includes research into organizational programs and

complementary computer-based tools for improving information resource sharing among the elements of the Defense scientific and technical community. Some of the specific areas now under DTIC review are: shared cataloging programs encompassing technical reports produced within the DoD; local library automation systems which incorporate resource sharing options; online database directory designs; and common command languages for accessing external, commercial and government databases via intelligent gateways.

This paper focuses on the development of the Integrated Bibliographic Information System (IBIS), a DTIC effort to test the concept of combining an integrated library system with an intelligent gateway that is capable of querying and updating -- simultaneously -- heterogeneous databases. Queries and updates of any database will be performed using a common command language that is currently under development. This development will relieve the system user of the need to master separate languages and procedures for each database accessed. The operational version of the IBIS will provide the combination of automated features needed for integrating DoD libraries and information centers into a coordinated STI network.

DOD LIBRARY ENVIRONMENT

The magnitude of this challenge can be sized by considering the complexity of the library environment. There are over 500 technical libraries and information centers currently operating throughout the U.S. supporting DoD research centers and laboratories. During fiscal year 1985, the DoD budgeted 30 billion dollars for research, development, test, and evaluation (RDT&E). Military planners expect the RDT&E budget to show a 2-3 percent real growth annually through the year 2000; a study by the National Science Foundation supports this expectation (Ref. 1). The outlook is for a continued burgeoning of scientific and technical information and a growing urgency to cope with its bulk in ways that make vital information readily accessible to all users at acceptable costs.

Responsible for mastering a tidal wave of new data holdings, the DoD information manager can easily lose sight of the fact that the essential element in the DoD RDT&E program is the DoD researcher -- the manager's primary client. DoD libraries serve as two-way information conduits between researchers and information resources. Through these libraries, the results of the researcher's work flow out to and are shared with the larger DoD community. Conversely, the library must collect, merge, and organize relevant information needed by scientists and researchers. Within the DoD, three basic bibliographic resources are called upon by technical libraries to support RDT&E information requirements: 1) a local catalog, evolved over time to meet local patron needs, 2) the DTIC Technical Reports (TR) database reflecting resources available within the DoD scientific and technical community at large, and 3) commercial databases and bibliographic utilities such as DIALOG, BRS, or SDC/ORBIT. All these sources are different in format, content, query language, and communications protocols. Yet, to meet patron needs, the technical library must effectively integrate all three types of resources. The library must control and channel relevant data to the researcher.

CHANGES IN PATRON PERSPECTIVE

To further complicate the job of the technical library, the researcher's approach to information is changing. The emphasis has shifted from concern about information supply to apprehensiveness about information selection. In Megatrends, John Naisbitt describes information as "a key resource that is not only renewable but self-generating. Running out of it is not a problem but drowning in it is" (Ref. 2). The sheer volume of information available has added a new dimension to the question of relevance versus recall. Researchers want information that applies to their work; they do not want, nor do they have the time, to cull relevant information from large quantities of irrelevant data. The role of the librarian is to acquire and supply information that supports the researcher in an efficient way; the librarian must anticipate and meet the information accessing needs of the researcher. The IBIS that this paper describes attacks much of the DoD researcher's information relevancy and accessing problem by supplying a single tool for opening many information spigots of diverse designs.

While the patrons of DoD technical libraries have characteristics in common, each library is unique in responding to the management direction and subject matter needs of the laboratory or research center it supports. The result is a wide range of library sizes, a variety of operating conditions and methods, and divergent, unique local collections. What these libraries do have in common are: 1) local collections consisting largely of scientific and technical reports, 2) portions of the collections which are security-classified and subject to circulation restrictions, 3) monographs and serials, 4) an established relationship with DTIC as the central source within the DoD for technical reports and 5) a need to combine local collections of bibliographic resources with commercially-available resources related to science, technology, engineering, and other general research areas.

Despite the diversity in organization, management, and patron orientation, DoD technical libraries perform the same basic functions as any other library: cataloging, reference, and circulation management and control. A local collection, supporting local patron needs, provides the core resource. For online reference to DoD-related technical report citations, DoD technical libraries rely on the DTIC Technical Reports database. Many of these libraries are also members of the DoD Shared Bibliographic Input Network (SBIN), which utilizes DTIC's Technical Reports database for the shared, online cataloging of technical reports (Ref. 3). SBIN allows a participating library to enter new cataloging data or append a holdings indicator to an existing catalog record. This is similar to the manner in which participating DoD libraries can update and share the cataloging of their book collection via the Online Computer Library Center (OCLC). In addition, most DoD libraries also rely on commercial bibliographic sources, such as DIALOG, LEXIS/NEXIS, OCLC and ORBIT, and on other government databases, chiefly the National Aeronautics and Space Administration (NASA) RECON and the Department of Energy (DoE) RECON, to meet patron demands for information. Regardless of size, each DoD technical library must maintain and exercise a range of bibliographic resources to meet patron needs.

AUTOMATED SYSTEM DEVELOPMENT

In 1983, DTIC was presented with the challenge of developing a library automation system responsive to the networking and local collection management needs of the DoD library community. The system would be required to support centralized resource sharing while allowing local processing flexibility. The objective was to permit DoD libraries to make maximum use of existing information, organize this information to meet local needs, and selectively share newly generated information with other members of the community. The system design to accomplish this would have to integrate local control for local collection management functions (reference, cataloging, and circulation) with access to the external resources required for reference, shared cataloging, and integrity protection for the central catalog -- the DTIC TR database.

The automation needs of the DoD libraries were defined through a requirements study that was initiated in 1983, and which included surveys, site visits, and staff interviews throughout the DoD technical library community (Ref. 4). Based on this study, a development and demonstration system to meet these requirements was specified and is the objective of the IBIS project. The requirements that IBIS is expected to satisfy are summarized as follows.

Local Collection Management: Local cataloging, retrieval, and circulation capabilities are essential IBIS system requirements. Acquisition and serials management functions are desirable system features; they can be added at a later date.

External Database Access: System capabilities to input data to and retrieve data from external databases are critical. Uploading and downloading capabilities are essential. The DTIC TR database is a primary external resource; accessibility by IBIS is vital to the cataloging and reference functions of the libraries.

Integration of Local Collection Management and External Database Access Capabilities: These capabilities are to be resident on one computer and accessible by an authorized user from a terminal equipped with video display screen.

Common Command Set for Performing Functions Locally or Externally: A single command language is necessary for users. The IBIS will perform the necessary protocol translations between the single command language internal to IBIS and the diverse command structures of the external databases. The common command set will relieve the user of the need to learn and master separate languages and procedures for each database accessed. However, "native" language access to external databases must be available to the user.

Simultaneous Access to External Data Sources and the Local Catalog for Reference Searching: The libraries are to be able to run the same search query against multiple databases, local and external, simultaneously. Search results are to be delivered to a single terminal.

vendors to run their different packages reflect this tendency. It has become evident that a distinct IBIS configuration, to support smaller DoD libraries, will be needed.

The hardware configurations required to support the prototype IBIS at DNA fell in the minicomputer range. A minicomputer-based system is uneconomical for smaller DoD technical libraries with collection sizes ranging from 5,000 to 75,000 items. A microcomputer-based system is appropriate for the lower transaction volumes and smaller operating budgets associated with these libraries. Therefore, DTIC has initiated an effort to identify and isolate the special requirements of these smaller DoD libraries and accommodate them. A software survey will be performed to identify packages suitable for servicing these smaller libraries and, at the same time, compatible with TIS. The U.S. Army Training and Doctrine Command library has been selected as the prototype site for the microcomputer-based version of the IBIS.

An IBIS product line suitable for any DoD library, as characterized by collection size and transaction volume, is expected to result from this dual approach.

CONCLUSION

Implementation of the prototype IBIS will demonstrate the feasibility of integrating diverse, yet functionally compatible, automation resources for special libraries. The major technologies -- software, hardware, and telecommunications -- necessary to implement the IBIS concept already exist. Successful completion of the IBIS project is dependent upon blending modifications of existing technological components to arrive at an integrated system running on one computer and accessible by any user over a single terminal.

Implementation of the production IBIS will provide DoD's scientific and technical community with a powerful, responsive information tool. The IBIS will render timely, comprehensive information support to DoD research, development, and engineering programs. It will diminish the duplication of intellectual efforts by making it more certain, easier, and faster to determine if like work has been done already.

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